

DRAFT

Barrier Shoreline Restoration Alternative Measures

The following measures have been identified as addressing the ideas and concerns of those involved in the Barrier Shoreline Restoration Plan Formulation meetings on 30 November 2000 and 7 February 2001. These measures incorporate all comments received through the scoping process that are consistent with the scope of the study. These measures will be used to formulate alternative plans for analysis. Please note that whereas some of the measures are mutually exclusive, others can interact (either positively or negatively), and others will have no interaction. Brief descriptions of the rationale and desired results are included.

Reach 1 – Headland (Caminada Headland from Belle Pass to Caminada Pass)

- **Nourish Shoreline.** This measure recognizes that the headland is the erosional source of sediment for reaches to the east and, formerly, to the west. The headland shoreline has one of the highest erosion rates in the country, averaging up to 65 feet/year in some areas. This measure includes introduction of sand into the littoral drift by placement on the shoreline directly or as feeder berms for nourishment purposes. The highest priority would be given to placing material in updrift areas in order to minimize or halt shoreline retreat in these areas. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Build Dunes.** In some areas there are no existing dunes (or very small ones) to provide protection for the back marsh. This measure would build dunes through sand placement and possibly sculpting. This can be done in conjunction with nourishing the shoreline or as a stand-alone measure. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Remove Existing Breakwaters.** A series of breakwaters constructed of sunken barges filled with rocks and a-jacks are located near the western portion of the headland. This is the nodal point on the headland where the littoral drift is both east and west. These breakwaters are creating erosional shadows in both directions by interrupting the natural longshore transport, and are considered a hazard to people using this area for recreation. They are also beginning to degrade. This measure would only be considered in conjunction with some type of beach nourishment if they would be an impediment to the project.
- **Fill/Plug the BP and LOOP Pipeline Canals.** The LOOP canal, in conjunction with the BP canal, acts as a direct conduit for tidal flow into areas that historically had much slower tidal currents. Filling or plugging the canals would help to restore the natural hydrology in the area. Filling could create marsh as well. The LOOP canal was supposed to be back-filled after construction, but only the original material was returned to the canal, which proved to be inadequate. The LOOP canal also creates a weak point in the shoreline that could increase erosion that area. The BP canal has to remain open for access. The measure provides for

DRAFT

plugging other channels, water bodies, canals, bayous, etc. at their intersections with the BP canal. Plugs at critical junctures would help restore the hydrology to a more natural state.

- **Create/Nourish Marsh.** This measure would create marsh through traditional dredge and fill methods or nourish marsh with a more dilute slurry or spray dredge. It could be applied along the entire reach or in selected portions of the Bayou Moreau area. This area has experienced a high rate of marsh degradation. Marsh nourishment would typically be used in areas with broken marsh to avoid covering existing vegetation, whereas traditional fill methods would be used in areas of shallow open water. Dredge and fill in open areas without containment could also nourish adjacent areas. Aquatic organism access and interspersions of tidal creeks and ponds would be maintained. Marsh creation would include vegetative planting of multiple native species, including woody species, where appropriate.

Reach 2 – Grand Terre (West side of Barataria Pass to east side of Pass Ronquille)

- **Nourish Shoreline.** This reach includes West Grand Terre, East Grand Terre, and Grand Pierre islands. The shoreline has one of the highest erosion rates in the country, with short-term (1988-2000) erosion rates averaging 18.9 ft/year, 46.8 ft/year, and 34.4 ft/year respectively. This measure includes introduction of sand into the littoral drift by placement of sand on the shoreline directly or as feeder berms for nourishment purposes. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate. West Grand Terre Island is currently a designated Beneficial Use disposal site for material dredged from Barataria Waterway, so coordination with maintenance dredging activities is necessary.
- **Build Dunes.** In some areas there are no existing dunes (or very small ones) to provide protection for the back marsh. This measure would build dunes through sand placement and possibly sculpting. This can be done in conjunction with nourishing the shoreline or as a stand-alone measure. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Terminal Structure at Barataria Pass.** Some type of terminal structure (armoring, t-groin, etc.) could be used to retain sand on West Grand Terre Island to prevent loss of material into Barataria Pass. This is the downdrift end of a littoral cell and sediment is currently being lost into the channel or to the Barataria ebb tidal shoal. This measure would also serve to protect Fort Livingston. The west wall of Fort Livingston extends into the surf zone. This valuable historical resource is in danger of being eroded away. West Grand Terre Island is a designated Beneficial Use disposal site for material dredged from Barataria Waterway, so coordination with maintenance dredging activities is necessary.
- **Bay-side Shoreline Protection.** This measure would consist of constructing shoreline protection on the bay side of the Grand Terre islands (e.g., segmented breakwaters, artificial reefs/islands, armoring). The back marshes of the islands are subjected to the high-energy wave climate of Barataria Bay. The long term (1884-1988) bay-side erosion rate averages up

DRAFT

to 15 feet/year in some areas. This measure could decrease bay-side marsh erosion and would have an added benefit of protecting cultural resources on West Grand Terre Island.

- **Create/Nourish Marsh.** This measure would increase the back-barrier marsh area and increase island stability/longevity. It would create marsh through traditional dredge and fill methods or nourish marsh with a more dilute slurry or spray dredge. This measure could be applied to all islands in the reach or in selected areas. This area has experienced a high rate of marsh loss and degradation. Marsh nourishment would typically be used in areas with broken marsh to avoid covering existing vegetation, whereas traditional fill methods would be used in areas of shallow open water. Dredge and fill in open areas without containment could also nourish adjacent areas. Aquatic organism access and interspersions of tidal creeks and ponds would be maintained. Marsh creation would include vegetative planting of multiple native species, including woody species, where appropriate.
- **Fill Pipeline Canals.** The numerous canals cutting through the islands create weak points that are likely to increase erosion and possible breaching. Some canals could be filled and planted to create marsh. Canals that are no longer in use could possibly be filled to higher elevations (ridges) and planted with woody species. Most canals already have woody species growing on their spoil banks.

Reach 3 – Cheniere Ronquille (East side of Pass Ronquille to Grand Bayou Pass)

- **Nourish Shoreline.** This reach includes Point Cheniere Ronquille, Pass la Mer to Chaland Pass, and Chaland Pass to Grand Bayou Pass (fronting Bay Joe Wise). Shoreline erosion has historically been high in this reach, with long-term rates (1884-2000) averaging 30.1 ft/year, 20.2 ft/year, and 6.3 ft/year, respectively. Short-term erosion rates (1988-2000) were 14.6 ft/year, 7.1 ft/year, and 4.8 ft/year, respectively. This measure includes introduction of sand into the littoral drift by placement of sand on the shoreline directly or as feeder berms for nourishment purposes. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Build Dunes.** In some areas there are no existing dunes (or very small ones) to provide protection for the back marsh. This measure would build dunes through sand placement and possibly sculpting. This can be done in conjunction with nourishing the shoreline or as a stand-alone measure. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Create/Nourish Marsh.** This measure would increase the back-barrier marsh area and increase island stability/longevity. It would create marsh through traditional dredge and fill methods or nourish marsh with a more dilute slurry or spray dredge. This measure could be applied to all islands in the reach or in selected areas. This area has experienced a high rate of marsh loss and degradation. Marsh nourishment would typically be used in areas with broken marsh to avoid covering existing vegetation, whereas traditional fill methods would be used in areas of shallow open water. Dredge and fill in open areas without containment

DRAFT

could also nourish adjacent areas. Aquatic organism access and interspersions of tidal creeks and ponds would be maintained. Marsh creation would include vegetative planting of multiple native species, including woody species, where appropriate.

- **Fill Pipeline Canals.** The numerous canals cutting through the islands create weak points that are likely to increase erosion and possible breaching. Considerable loss of sediment may occur when storms cause the washover of shoreline material into shore-parallel canals that are close to the gulf shoreline. Some canals could be filled and planted to create marsh. Canals that are no longer in use could possibly be filled to higher elevations (ridges) and planted with woody species. Most canals already have woody species growing on their spoil banks.
- **Restore Maritime Forest.** Cheniere Ronquille historically supported maritime forest. The relict beach ridges that supported the forest have eroded away. A very small fragment still occurs here and could possibly be expanded with increased island stability. This measure may require back dune construction to mimic relict beach ridges and provide the elevation needed for maritime forest species. This measure could alternately consist of planting other appropriate woody species.

Reach 4 - Shell Island (Grand Bayou Pass to Empire Jetties)

- **Restore Shell Island.** Shell Island (a.k.a. Lanaux Island) was a continuous peninsula from the Empire Waterway (Fontanelle Bayou) extending northwestward across Bastian and Shell Island bays to Grand Bayou. Lack of sediment from the Mississippi River and the interruption of longshore drift by the construction of the Empire jetties in 1949/1950 caused severe erosion of Shell Island. In 1979, the peninsula was breached by Hurricane Bob and most remaining sediment was lost into the shore-parallel pipeline canal. All that remains are a few scattered fragments of the former island and a larger portion on the western end, now called Bastian Island. This measure proposes to rebuild the island with dredged material to restore shoreline integrity and provide protection to back-barrier areas, and includes construction of beach, dune, and back marsh habitats.
- **Modify the Empire Jetties.** The Empire jetties have interrupted the longshore drift of sediment from east to west, contributing to severe erosion on the shorelines of this reach. The west jetty is completely detached from land and the land is eroding away from the back side of the east jetty. Some modifications to the jetties may be needed with or without restoration of the adjacent shoreline and to improve longshore sediment transport.
- **Create Artificial Ridges/Reefs.** Instead of, or in addition to, island reconstruction, recycled oyster shells or other hard material could be utilized to create storm ridges and/or reefs. These ridges and/or reefs would provide additional habitat types and potentially reduce the impact of waves along the back-barrier areas.

DRAFT

Reach 5 – Scofield (Empire Jetties to Sandy Point)

- **Nourish Shoreline.** This reach extends from the Empire jetties to Sandy Point and includes Pelican Island, the shoreline protecting Scofield Bay and Bay Coquette, and Sandy Point. This reach has experienced a high degree of shoreline erosion with long term (1884-1988) erosion rates averaging up to 33 feet/year in some areas. The shoreline bordering Bay Coquette is highly fragmented. This measure includes introduction of sand into the littoral drift by placement of sand on the shoreline directly or as feeder berms for nourishment purposes. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Build Dunes.** In this reach there are no existing dunes (or very small ones) to provide protection for the back marsh. This measure would build dunes through sand placement and possibly sculpting. This can be done in conjunction with nourishing the shoreline or as a stand-alone measure. Sand fencing and/or vegetative plantings (including woody species) would be included where appropriate.
- **Create/Nourish Marsh.** This area has experienced a high rate of marsh loss and degradation. The marshes that formerly surrounded Scofield Bay and Bay Coquette are virtually gone. This measure would increase the back-barrier marsh area and increase island stability/longevity. It would create marsh through traditional dredge and fill methods or nourish marsh with a more dilute slurry or spray dredge. This measure could be applied to all islands in the reach or in selected areas. Marsh nourishment would typically be used in areas with broken marsh to avoid covering existing vegetation, whereas traditional fill methods would be used in areas of shallow, open water. Dredge and fill in open areas without containment could also nourish adjacent areas. Aquatic organism access and interspersions of tidal creeks and ponds would be maintained. If marsh is created around the bays, some type of shoreline armoring may be needed. Marsh creation would include vegetative planting of multiple native species, including woody species, where appropriate.
- **Fill Pipeline Canals.** The numerous canals cutting through the islands create weak points that are likely to increase erosion and possible breaching. Considerable loss of sediment may occur when storms cause the washover over of shoreline material into shore-parallel canals that are close to the gulf shoreline. Some canals could be filled and planted to create marsh. Canals that are no longer in use could possibly be filled to higher elevations (ridges) and planted with woody species. Most canals already have woody species growing on their spoil banks.
- **Restore/Reconnect Sandy Point.** Sandy Point was historically connected to the shoreline to the west. It has been breached and significantly reduced in size. The island could be enlarged with dredged sediments and possibly reconnected to the nearby western shoreline thereby increasing shoreline integrity.